What is claimed is:

1. A method of converting a series of data word into a modulated signal with coding rate of *m/n*, comprising the steps of:

(a) generating for each data word a number of intermediate sequences by combining mutually different digital words with the data word wherein a length *r* of the digital word has been determined such that bit length of the data word added by the length *r* is a multiple of *m*;

(b) scrambling each intermediate sequence to form a set of alternative sequences;

(c) translating each alternative sequence into a (d,k) constrained sequence according to the coding rate m/n; and

(d) measuring how much undesirable each (d,k) constrained sequence is, and selecting one (d,k) constrained sequence for recording onto a recordable medium among the translated (d,k) constrained sequences based on the measured results.

2. The method set forth in claim 1, wherein said length *r* is 4, 5, or 6.

3. The method set forth in claim 1, wherein said length *r* has been determined in proportion to the length of the data word.

4. A method of converting a series of data word into a modulated signal with coding rate of *m/n*, comprising the steps of:

(a) dividing an input data word into two or more data segments, the input data word having data size a sync signal is to be combined with before being written in a recordable medium;

(b) generating for each divided data segment a number of

intermediate sequences by combining mutually different digital words with the data segment;

(c) scrambling each intermediate sequence to form a set of alternative sequences;

(d) translating each alternative sequence into a (d,k) constrained sequence according to the coding rate m/n; and

(e) measuring how much undesirable each (d,k) constrained sequence is, and selecting one (d,k) constrained sequence for recording onto the recordable medium among the translated (d,k) constrained sequences based on the measured results.

5. The method set forth in claim 4, wherein said length *r* of the digital word has been determined such that bit length of the divided data segment added by the length *r* is a multiple of *m*.

6. The method set forth in claim 4, wherein said length *r* is 4, 5, or 6.

7. The method set forth in claim 4, wherein said length *r* has been determined in proportion to the length of the divided data segment.

8. The method set forth in claim 4, wherein said step (a) divides the input data word into two data segments in case of the coding rate m/n=9/13.

9. The method set forth in claim 8, wherein the divided data segments are all same in size as 364 and said length *r* is 5.

10. The method set forth in claim 4, wherein said step (a) divides the input data word into eight data segments in case of the coding rate m/n=6/11.

11. The method set forth in claim 10, wherein the divided data

segments are all same in size as 91 and said length *r* is 5.

12. The method set forth in claim 4, wherein at least two of the divided data segments are different each other in size.

13. The method set forth in claim 12, wherein all of the divided segments are not same in size.

14. The method set forth in claim 4, wherein said length *r* is 5 and *k* is equal or larger than 10 in case of m/n=9/13 and d=1.

15. The method set forth in claim 4, wherein said length *r* is 5 and *k* is equal or larger than 13 in case of m/n=6/11 and d=2.

16. An apparatus of converting a series of data word into a modulated signal with coding rate of m/n where m<n, comprising:

an augmenting means generating for each data word a number of intermediate sequences by combining mutually different digital words with the data word wherein a length *r* of the digital word has been determined such that bit length of the data word added by the length *r* is a multiple of *m*;

a scrambler scrambling each intermediate sequence to form a set of alternative sequences;

an encoder translating each alternative sequence into a (d,k) constrained sequence according to the predefined coding rate m/n; and

a selecting means measuring how much undesirable each (d,k) constrained sequence is, and selecting one (d,k) constrained sequence for recording onto a recordable medium among the translated (d,k) constrained sequences based on the measured results.

17. The apparatus set forth in claim 16, wherein said length *r* is 4, 5, or 6.

18. The apparatus set forth in claim 16, wherein said length *r* has been determined in proportion to the length of the data word.

19. An apparatus of converting a series of data word into a modulated signal with coding rate of m/n where m<n, comprising:

a divider partitioning an input data word into two or more data segments, the input data word having data size a sync signal is to be combined with before being written in a recordable medium;

an augmenting means generating for each partitioned data segment a number of intermediate sequences by combining mutually different digital words with the data segment;

a scrambler scrambling each intermediate sequence to form a set of alternative sequences;

an encoder translating each alternative sequence into a (d,k) constrained sequence according to the predefined coding rate m/n; and

a selecting means measuring how much undesirable each (d,k) constrained sequence is, and selecting one (d,k) constrained sequence for recording onto a recordable medium among the translated (d,k) constrained sequences based on the measured results.

20. The apparatus set forth in claim 19, wherein said length *r* of the digital word has been determined such that bit length of the partitioned data segment added by the length *r* is a multiple of *m*.

21. The apparatus set forth in claim 19, wherein said length *r* is 4, 5, or 6.

22. The apparatus set forth in claim 19, said divider partitions the input data word into two data segments in case of the coding rate

m/n=9/13.

23. The apparatus set forth in claim 22, wherein the partitioned data segments are all same in size as 364 and said length *r* is 5.

24. The apparatus set forth in claim 19, wherein said divider partitions the input data word into eight data segments in case of the coding rate m/n=6/11.

25. The apparatus set forth in claim 24, wherein the partitioned data segments are all same in size as 91 and said length *r* is 5.

26. The apparatus set forth in claim 19, wherein at least two of the partitioned data segments are different each other in size.

27. The apparatus set forth in claim 26, wherein all of the partitioned data segments are not same in size.

28. The apparatus set forth in claim 19, wherein said length *r* is 5 and *k* is equal or larger than 10 in case of m/n=9/13 and d=1.

29. The apparatus set forth in claim 19, wherein said length *r* is 5 and *k* is equal or larger than 13 in case of m/n=6/11 and d=2.

30. An information recording medium having data modulated and recorded thereon according to method of claim 1.

31. An information recording medium having data modulated and recorded thereon according to method of claim 4.

32. A demodulation device for demodulating data modulated in accordance with method of claim 1.

33. A demodulation device for demodulating data modulated in accordance with method of claim 4.